

Landfill

(Unit 004)

Location Restrictions Demonstration

**Limestone Electric Generating Station
Jewett, Texas**

October 2018

Prepared For:

NRG Texas Power LLC



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Certification

I, the undersigned Texas Professional Engineer, hereby certify that I am familiar with the technical requirements of Title 40 Code of Federal Regulations Part 257 Subpart D (§257). I also certify that it is my professional opinion that, to the best of my knowledge, information, and belief, that the information in this demonstration is in accordance with current good and accepted engineering practice(s) and standard(s), and meets the requirements of §257.64.

For the purpose of this document, "certify" and "certification" shall be interpreted and construed to be a "statement of professional opinion". The certification is understood and intended to be an expression of my professional opinion as a Texas Licensed Professional Engineer, based upon knowledge, information, and belief. The statement(s) of professional opinion are not and shall not be interpreted or construed to be a guarantee or a warranty of the analysis herein.

Jason Leik
Jason Leik, P.E.

91043
Texas License Number

[Signature]
Signature of Professional Engineer

10/12/18
Date



FIRM #3775

Section 1

Background

The purpose of this document is to demonstrate the compliance of the Landfill (Unit 004) at the Limestone Electric Generating Station (Station) with the location restrictions outlined in the Environmental Protection Agency's (EPA's) final coal combustion residuals (CCR) rule (Title 40 Code of Federal Regulations Parts 257 and 261) Subpart D - "Standards for the Disposal of Coal Combustion Residuals in Landfills and Surface Impoundments" (§257.60 through §257.64, federal rule). The Landfill (Unit 004) is considered a CCR landfill and is only subject to the location restriction for unstable areas (§257.64). This document includes information from a desktop study and Site work to demonstrate that Unit 004 is not located in unstable areas (§257.64).

1.1 Site Setting

The NRG Texas Power LLC (NRG) Station is located in Jewett, Leon County, Texas, adjacent to Smithers Lake (Figure 1). The electricity generating portion of the Site, or the main Plant Operations Area (Plant Area) is located along the southeastern shore of the lake.

The Landfill is located east of FM39 in the northern portion of the Solid Waste Disposal Area (SWDA). The landfill lies to the north of the intermittent Lynn Creek. The shallow aquifer in the vicinity of the landfill is unconfined and consists of interbedded sands, silts, and clays. The alluvium unit is laterally continuous and is at least 50 feet thick in the area of the landfill (EPRI, 2007). Borehole depths installed in the vicinity of the landfill ranged from 35 to 70 ft. below ground surface (bgs). Boring logs from the wells indicate the lithology consists mainly of silty sand southeast of the landfill, and clayey sand to silty clay with gradations into and from interbedded mud/clay and silt and shale at various intervals to the north and northeast.

The characterization of the local geology is based on observations recorded during the completion of soil borings. The surficial material around the SWDA consists of in-situ or reworked clay from the Axtell-Tabor soil association. This clay is the source of material for the SWDA liner and cap. The surficial material is underlain by interbedded clays, silts, and sands of the Quaternary alluvium, Carrizo Sand, and Calvert Bluff Formation. The boundaries between these units are generally indistinguishable (EPRI, 2007).

According to the Geologic Atlas of Texas, Waco Sheet (BEG 1972), the Site is primarily located within the outcrop of the Calvert Bluff Formation of the Wilcox Group. Minor portions of the southeast corner of the Site are located within the outcrop of the Carrizo Sand and minor portions of the southwest corner of the Site are immediately underlain by alluvium. The Calvert Bluff Formation underlies both the Carrizo Sand and alluvium where present.

1.2 Landfill (Unit 004)

The Landfill (Unit 004) is used for the final disposition of coal combustion residual waste. The landfill was constructed in 1980. The landfill is divided into multiple areas for organizational purposes. The western half of the landfill is full and is capped. The location restriction designated in the federal CCR rule is presented below with a corresponding demonstration to show compliance with the restriction. The location restriction for the landfill includes unstable areas.

Section 2

Location Restrictions

The location restriction designated in the federal CCR rule is presented below with a corresponding demonstration to show compliance. The location restriction includes conformance with the unstable area criteria.

2.1 §257.64 - Unstable Areas

The federal CCR rule requires that CCR units not be located in an unstable area unless the owner or operator demonstrates that recognized and generally accepted good engineering practices have been incorporated into the design of the CCR unit to ensure that the integrity of the structural components of the CCR unit will not be disrupted. Factors associated with soil conditions resulting in significant differential settlement, geologic or geomorphologic features, and human-made features or events must be evaluated to determine compliance.

This demonstration was performed by evaluating the results of a Site visit by a Texas registered professional engineer, reviewing local geology and topography, and evaluating human-made features or events at the Landfill (Unit 004) area.

None of the geological or geomorphological information reviewed suggest the presence of unstable areas at the Landfill (Unit 004). On-Site or local soil conditions have not resulted in differential settling. Unstable areas are not present at the Site as a result of human-made features or events.

Evidence of unstable areas was not observed during the Site inspection of the Landfill (Unit 004). The following presents a summary of the Landfill (Unit 004) inspection conducted on September 10, 2018 by Mr. Jason Leik, P.E. Photographs taken during the inspection are included in Appendix A.

The berms on the west and half of the north and south sides are in their final configuration and are in good condition. No areas of bulging or depression were observed. No areas of erosion were noted except on the southern toe of the berm near the transition area to the active areas. The top of the western half of the landfill is uniformly capped and sloped with no areas of depression or stressed vegetation. There were no seeps on the west side or top of the landfill.

Storm water from the capped area of the landfill is routed to the base of the landfill around the toe of the berm on all three sides (north, west and south). All drainage eventually ends up in Pond 002 just south of the landfill which has the ability to discharge through permitted Texas

Pollutant Discharge Elimination System (TPDES) Outfall 002. A large drainage swale runs along the toe of the south side berm, which collects most of the runoff from the active areas and then drains into Pond 002. This swale has eroded the vegetation from the bottom one-fourth of the berm near the transition between the completed landfill and the active area. In this eroded area, some seepage and erosion were observed. Because this area is in the transition between completed and active areas, the erosion and seepage observed do not represent an unstable feature.

There is an active natural gas well along with associated compression equipment located in the center of the landfill, in the unused area 13. According to NRG representatives, the landfill will be built around the gas well pad. A narrow area between the gas pad and the completed landfill has been prepared to receive waste but has not yet been used. Aside from the well, no unstable areas were observed at the Landfill (Unit 004) area.

Evidence of unstable areas due to soil conditions resulting in significant differential settling, geologic or geomorphologic features, or human-made features or events is not supported by this determination; therefore, the existing Landfill (Unit 004) is not located in unstable areas. The existing (Unit 004) is in compliance with the requirements of §257.64.

Section 3

Conclusions

Based on the evaluation provided in this demonstration, the existing Landfill (Unit 004) at the Limestone Electric Generating Station is in compliance with the location restrictions provided in §257.64 of the CCR rule. No additional action, justification, or demonstration is required to document compliance with the location restrictions provided in the CCR rule after this demonstration has been placed into the operating record, posted to the publicly accessible website, and provided for government notification.

Section 4

References

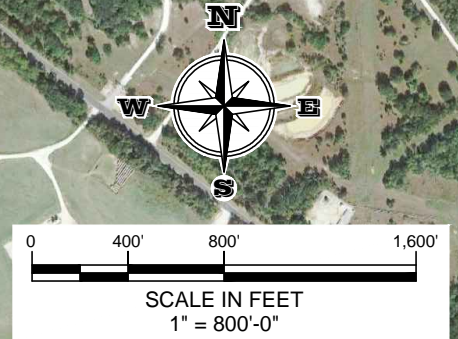
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Soil Survey Staff, Natural Resources Conservation Service, United States Department of Agriculture. Web Soil Survey. Available online at <http://websoilsurvey.nrcs.usda.gov/>. Accessed [09/12/2018].

United States Geological Survey (USGS). 2018. USGS - Texas Geology Web Map Viewer: Available online at <https://txpub.usgs.gov/dss/texasgeology/>. Accessed [9/14/2018].

Figures

HOU_M:\ACAD-TRC\DRAWING\NRG\Limestone Station - Jewett-TX Fig 2 - NRG-LimestoneStation - Landfill.dwg 09/26/18



LANDFILL

F.M. 80

F.M. 39

COUNTY RD. 795

COUNTY RD. 795

LEGEND
 - - - - - APPROXIMATE PROPERTY BOUNDARY

PROJECT:	NRG TEXAS POWER, LLC Limestone Electric Generating Station Jewett, Texas	
TITLE:	LANDFILL	
DRAWN BY:	O. Fonseka	PROJECT No.: 298367.0000.0000
CHECKED BY:	T. Dworaczyk	FIGURE 2
APPROVED BY:	T. Dworaczyk	
DATE:	September 2018	

TRC 10550 Richmond Ave.
Suite 210
Houston, TX 77042
Phone: 713.244.1000

IMAGERY SOURCE: Google Earth (10/30/2014)

FILE: Fig 2 - NRG-LimestoneStation - Landfill.dwg

Appendix A

Photographs



Location: W Side of Landfill CCR Unit 004 Facing N

Site: Limestone Owner: NRG

Photograph Taken by: Jason Leik Date of Inspection: 9/10/18



Location: W Side of Landfill CCR Unit 004 Facing S

Site: Limestone Owner: NRG

Photograph Taken by: Jason Leik Date of Inspection: 9/10/18



Location: W Side of Landfill CCR Unit 004 Facing S

Site: Limestone Owner: NRG

Photograph Taken by: Jason Leik Date of Inspection: 9/10/18



Location: W Side of Landfill CCR Unit 004 Facing E

Site: Limestone Owner: NRG

Photograph Taken by: Jason Leik Date of Inspection: 9/10/18



Location: SW Corner (Top) of Landfill CCR Unit 004 Facing N

Site: Limestone Owner: NRG

Photograph Taken by: Jason Leik Date of Inspection: 9/10/18



Location: SW Corner (Top) of Landfill CCR Unit 004 Facing E

Site: Limestone Owner: NRG

Photograph Taken by: Jason Leik Date of Inspection: 9/10/18



Location: SW Corner (top) of Landfill CCR Unit 004 Facing NE

Site: Limestone Owner: NRG

Photograph Taken by: Jason Leik Date of Inspection: 9/10/18



Location: SW Corner (top) of Landfill CCR Unit 004 Facing NE

Site: Limestone Owner: NRG

Photograph Taken by: Jason Leik Date of Inspection: 9/10/18



Location: SW Corner (top) of Landfill CCR Unit 004 Facing SE

Site: Limestone Owner: NRG

Photograph Taken by: Jason Leik Date of Inspection: 9/10/18



Location: SW Corner (top) of Landfill CCR Unit 004 Facing SE

Site: Limestone Owner: NRG

Photograph Taken by: Jason Leik Date of Inspection: 9/10/18



Location: S Side of Landfill CCR Unit 004 Facing W

Site: Limestone Owner: NRG

Photograph Taken by: Jason Leik Date of Inspection: 9/10/18



Location: S Side of Landfill CCR Unit 004 Facing W

Site: Limestone Owner: NRG

Photograph Taken by: Jason Leik Date of Inspection: 9/10/18



Location: S Side of Landfill CCR Unit 004 Facing N

Site: Limestone Owner: NRG

Photograph Taken by: Jason Leik Date of Inspection: 9/10/18



Location: N Side of Landfill CCR Unit 004 Facing E

Site: Limestone Owner: NRG

Photograph Taken by: Jason Leik Date of Inspection: 9/10/18



Location: N Side of Landfill CCR Unit 004 Facing W

Site: Limestone Owner: NRG

Photograph Taken by: Jason Leik Date of Inspection: 9/10/18



Location: N Side of Landfill CCR Unit 004 Facing S – drainage channel

Site: Limestone Owner: NRG

Photograph Taken by: Jason Leik Date of Inspection: 9/10/18



Location: E Side of Landfill CCR Unit 004 Facing N

Site: Limestone Owner: NRG

Photograph Taken by: Jason Leik Date of Inspection: 9/10/18



Location: E Side of Landfill CCR Unit 004 Facing NE – shows well pad

Site: Limestone Owner: NRG

Photograph Taken by: Jason Leik Date of Inspection: 9/10/18



Location: E Side of Landfill CCR Unit 004 Facing SE

Site: Limestone Owner: NRG

Photograph Taken by: Jason Leik Date of Inspection: 9/10/18



Location: E Side of Landfill CCR Unit 004 Facing SE

Site: Limestone Owner: NRG

Photograph Taken by: Jason Leik Date of Inspection: 9/10/18



Location: E Side of Landfill CCR Unit 004 Facing NE

Site: Limestone Owner: NRG

Photograph Taken by: Jason Leik Date of Inspection: 9/10/18



Location: E Side of Landfill CCR Unit 004 Facing W

Site: Limestone Owner: NRG

Photograph Taken by: Jason Leik Date of Inspection: 9/10/18



Location: E Side of Landfill CCR Unit 004 Facing W

Site: Limestone Owner: NRG

Photograph Taken by: Jason Leik Date of Inspection: 9/10/18